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## THE DEVELOPMENT OF THE MIDDLE EAR.<sup>1</sup>

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"A SYSTEMATIC physiology depends principally upon embryology, and cannot develop rapidly until the history of development is more perfected; for this history furnishes to the philosophical student the material for forming a well-founded conception of organic life. Therefore anatomists and physiologists should work more in this line than they now do; that is, every organ, every material, and even every function should be investigated with this question in mind, How have they originated?"

The history of embryological research bears witness to the truth of the above opinion, which I have freely translated from one of the great workers in embryology, — Emil Huschke. It was an earnest expression of a thought that had its origin in a philosophical study of Nature herself; unfortunately, thoughts founded upon such study but too often appear visionary to practical workers in text-book literature, so that to-day, in spite of the revival of interest in embryology, Huschke's words of forty years ago are just as appropriate as they then were.

Anatomy needs in every department the most general application of embryological research, not as a polish, not as a luxury, but as essential to a good understanding of it. Anatomy is presented as a mountain of dry, barren facts that are to be mastered by memory; the relations of position and function are almost the only relief to its barrenness. How different would it be if the history of the formation of the parts should enable the student to employ living, interesting principles by which to group and order the mass of details!

I have consulted the works of Fabricius ab Acquapendente, Malpighi, Leeuwenhoek, Cassebohm, Valsalva, Scarpa, Meckel, and Soemmering in vain for notices concerning the development of the external ear passages. Von Baer may be said to have begun this work; his contemporary, Huschke, furnished the views which are at present held. After stating their views we will trace the opinions concerning this question to our own day. Von Baer gives a summary of his observa-

<sup>1</sup> Read before the Suffolk District Medical Society, September 29, 1877.

tions on page 116 of the second part of his great work, *Entwicklungsgeschichte der Thiere*, as follows: "A diverticulum lined with mucous membrane grows from the pharynx toward the ear; it forms the Eustachian tube, and without doubt the tympanic cavity. This diverticulum begins just at the time at which the first branchial fissure closes and at the place of its closure; on the inner surface a transverse furrow remains for some time as a mark of the place of union of the first branchial cleft. The superior termination of the furrow extends gradually and forms the Eustachian tube; the rest of the furrow is obliterated. We will not leave unnoticed the facts that the Eustachian tube, at first very wide, as in the reptiles, at a later period becomes longer, yet lies upon the pyramid as in the mammalia; at last, however, as a characteristic of the birds, it is inclosed in the pyramid. The outer ear is formed by a development of the skin, which begins as a puffy wall, like that forming the eyelids. As the otic vesicle does not reach the surface, an involution is now formed which grows from this little prominence, through the substance lying under it, toward the vesicle; this is the meatus externus. The situation of this involution is, indeed, the space between the first and second branchial arches; still, I believe that I have with certainty observed that the first branchial fissure is first perfectly closed, though no furrow is perceived externally."

The view at present held, that of Huschke, is as follows: The first branchial arch unites with its fellow of the opposite side, thus forming a first branchial cleft continuous from one side to the other; a thin membrane then extends backward from the place of union of the first arches to the extremities of the second arches; this gives us a branchial cleft on each side, divided by this bridge of tissue from its fellow of the opposite side; these clefts close from their distal extremities, so that at last their proximal ends only remain open; this opening leads directly into the pharynx; the walls of the opening unite in their median portions to form the drum, leaving, internally, the pharyngeal extremity as the Eustachian tube, and the outer extremity as the meatus externus.<sup>1</sup>

Valentin<sup>2</sup> believed that the Eustachian tube was the remains of the inner portion of the first visceral cleft, but doubted if the tympanic cavity and the meatus externus were formed from it; in explanation of this doubt he says: "For if this cleft is at first somewhat wider posteriorly, it is seen, as soon as it is closed by a thin membrane, that the external indication of the opening of the ear is not on a line with this thin portion of skin, but plainly below it, in the substance of the posterior border of the first branchial arch. Indeed, if the fissure itself did form the meatus, it must have taken a different direction,

<sup>1</sup> *Isis von Oken*, vol. xx. p. 401, 1827; p. 162, 1828; p. 951, 1831. *Meckel's Archiv für Anat. und Phys.*, p. 40, 1832.

<sup>2</sup> *Handbuch der Entwicklungsgeschichte des Menschen*, Berlin, 1835, s. 211 and 212.

since the meatus externus does not continue the line of the previous branchial cleft, but cuts it at an oblique angle, as Huschke's own illustrations show."<sup>1</sup> Further on Valentin says: "The formation of the tympanic cavity takes place at the outer part of the hollow chamber opening into the mouth cavity: the inner wall of this chamber lies upon the closed opening of the labyrinth vesicle; its outer wall belongs clearly to the visceral plates. At the time when the Eustachian tube and tympanic cavity form a wedge-shaped passage, as I have seen it in a human embryo at the seventh week, a roundish pyramidal projection grows forward from the place where the involution, which at an earlier stage of development represented the labyrinth, closed; below and a little behind it is a similar but thicker growth; the first projection is the rudiment of the stirrup, the second the anvil and hammer. The outer opening of the tympanic cavity is closed in at this time, not only by a thin layer of integument, but also by a granular substance belonging to the visceral plates."

In 1847 Valentin<sup>2</sup> gives a different description, as follows: "The posterior angle of the first branchial fissure is closed merely by a thin membrane, the future annulus tympanicus. The section of the cleft inside this place of closure lengthens later, so that it forms the tympanic cavity and the Eustachian tube. The drum lies at first free to the surface, not in the same plane, however, but in a little furrow which is the rudiment of the meatus externus."

Rathke<sup>3</sup> at first sided with Von Baer in his view as to the formation of these parts, but soon afterwards we find him following the lead of Huschke.<sup>4</sup> Yet in 1839<sup>5</sup> he describes a furrow in the pharynx, which, at the beginning of the second period (the second period extended from the time at which there were four branchial clefts to the time when they were all closed), is scarcely indicated, but at the end of this period is quite deep; and then he says that this cavity represents the chamber which in young embryos of the mammalia forms the tympanic cavity and the Eustachian tube. In 1861<sup>6</sup> he describes the process as follows: "In birds and the mammalia the anterior (or first) branchial cleft grows together at about the middle of its depth; at this place of union the drum is formed; the outer section of the cleft becomes the meatus externus, the inner section the tympanic cavity and the Eustachian tube."

Bischoff did not devote much space to this subject; he appears to have accepted Huschke's views without much discussion.<sup>7</sup>

<sup>1</sup> Isis, 1828. Tab. 2, figs. 3 and 4.

<sup>2</sup> Lehrbuch der Physiologie des Menschen, Braunschweig, 1847.

<sup>3</sup> Isis von Oken, 1828, p. 85.

<sup>4</sup> Anat. Physiolog. Untersuchungen über den Kiemenapparat, 1832, pp. 119 and 120.

<sup>5</sup> Entwicklungsgeschichte der Natter (Coluber Natrix). Königsberg, 1839.

<sup>6</sup> Entwicklungsgeschichte der Wirbelthiere, Leipzig, 1861, p. 117.

<sup>7</sup> Entwicklungsgeschichte des Hunde Eies, Braunschweig, 1843, p. 109.

In 1851 Corti<sup>1</sup> and Reissner<sup>2</sup> published their famous researches upon the cochlea and on the internal ear; since this time much labor has been expended in working the field that they mapped out. Wonderful results have also been obtained by the study of the development of the ear in the invertebrata.

Kölliker,<sup>3</sup> in 1861, merely states the view of Huschke. In the new edition of his work<sup>4</sup> (the first half of which only has appeared), on page 300, he gives a figure showing a section of the head of a rabbit embryo ten days old, which he describes as follows: "The anterior part of the pharynx is seen, in regard to which it is to be noticed that its side wall on one side borders on the ectoderm, which is here somewhat depressed. The first branchial cleft was situated at this point, but this cleft is now closed; here also the tuba Eustachii and the membrana tympani are formed." In figure 175 (page 258) a rabbit embryo of the same age is portrayed with the first cleft wide open; this illustration is confirmed by the figure on page 300, where, although the text describes the first cleft as closed, the inferior maxillary processes of the first arch are not yet united. (In the description of figure 300 it is stated that the pharynx opens outwardly by means of a fissure between the inferior maxillary processes of the first branchial arch.) Such a relation is in direct contradiction to well-settled facts; surely no observer has seen an embryo in which the first branchial fissure is closed while the inferior maxillary processes are not yet united.

Schenk<sup>5</sup> dismisses the subject of the development of the Eustachian tube and the tympanic cavity with the following description: "The first branchial cleft in which the auditory ossicles come to be situated is the site of the tympanic cavity and the Eustachian tube." On page 138 he describes the outer ear as consisting at first of a round depression, in the bottom of which a little ridge is seen that corresponds to an auditory ossicle; he says that this depression is, according to his previous observations, the remains of the first branchial cleft, and that the place of closure remains membranous, forming the tympanum, which, even in the embryonic condition, is covered on both sides with epithelium. From this description it would seem that the cleft closed, leaving a depression on the external surface of the embryo; that this depression is the *membranous* drum covered with epithelium on *both sides*, and still an auditory ossicle forms in it.

Foster and Balfour<sup>6</sup> neglect all reference to the external ear passage

<sup>1</sup> Corti, A. Recherches sur l'Organe de l'Ouïe des Mammifères. Siebold's and Kölliker's Zeitschrift für wissenschaftliche Zoologie, Bd. iv. p. 109, 1851.

<sup>2</sup> De Auris internæ Formatione. Dissert. inaug. Dorpat, 1851.

<sup>3</sup> Entwickelungsgeschichte des Menschen und der höheren Thiere, pp. 120 and 321.

<sup>4</sup> Wilhelm Engleman, Leipzig, 1876.

<sup>5</sup> Lehrbuch der vergleichende Embryologie, Wien, 1874, pp. 82 and 138.

<sup>6</sup> The Elements of Embryology. Macmillan & Co., London, 1874.



of the chick, although they borrow Böttcher's description of the development of the internal ear in the mammalia; this omission is particularly unfortunate, as the many excellences of the work will bring it into general use as a text-book in England and America.

Mr. W. K. Parker's paper<sup>1</sup> is one of the most elaborate upon the subject which concerns us in our modern English literature; it is well illustrated, and like all of Mr. Parker's work is the result of honest, individual research. It offers a good opportunity of comparing the views which we shall present with those held by an observer who in his researches has employed the embryo of the animal which we have used; moreover, Mr. Parker's article is one of the fullest recently published, and almost the only illustrated statement of the views which are commonly held upon the development of the meatus, middle ear, and Eustachian tube.

Figure 8, plate xxviii., exhibits a horizontal section of the head of an embryo pig, two thirds of an inch long; the point of greatest interest to us is the cavity which is described as the first branchial cleft, in front of which the trunk of the facial nerve is located, external to it the jugular vein, and surrounding it the auditory sac. If this cavity were what it is described to be, it would follow that the trunk of the facial nerve lies in the mandible, the jugular vein in the new connective tissue that has filled in the first branchial fissure, and the fissure itself must have made an involution into the head-plates to have reached the site of the auditory sac, which is located in the head-plate above the root of the second arch; all these conclusions are manifestly incorrect, and the source of the error lies in the false opinion as to the character of the cavity referred to, which is in reality the interior of the auditory sac. Figure 9, plate xxix., is a view of the same cavity on a much larger scale, and as the auditory sac was bisected near its central portion, the figure furnishes much plainer evidence of the truth of the statement that we have just made; it is not difficult to trace the different parts of the auditory vesicle in the figure, though the nearly horizontal section is not so favorable to their demonstration as a vertical section would have been. The lower part of the cavity is partially divided by a projection of the surrounding tissue into two unequal parts; the larger, to the right, is that part of the sac where the sacculus rotundus forms; the lesser, to the left, is the section of that part of the sac from which the vertical semicircular canals are formed; the projection into the sac which is described as the head of Meckel's cartilage lies just under the point where the horizontal canal is being formed. Figure 10 of the same plate is a section extending the whole breadth of the head: the right of the figure shows the left side of the head of the embryo, where

<sup>1</sup> On the Structure and Development of the Skull of the Pig (*Sus Scrofa*). Philosophical Transactions, vol. clix., part 1st, 1874.

the section is situated in a higher plane than on the other side; the description of the figure contains all the errors that we have referred to, but as additional proof the relations of the aquæductus vestibuli are shown; the same cavity, described here as elsewhere as the first branchial fissure, is seen just outside of the section of the aquæductus, *which on the left of the figure borders the cavity*; this itself is indubitable proof of the truth of the assertion that we have made, that Mr. Parker confuses the interior of the auditory sac with the first branchial fissure; the error is rendered the more striking from the fact that the aquæductus is cut across after it has bifurcated, to send one branch to the future sacculus rotundus and the other to the future utriculus, consequently after it has entered the cavity of the auditory vesicle; this bifurcation explains the double lumen of the aquæductus, which seems to cause some doubt to Mr. Parker. (See page 299.) On the right of the figure the cavity just outside the aquæductus is called the tympanic cavity, and the description would make it appear that the aquæductus opens into this part of the ear; the cavity is the same as that shown on the other side of the figure.

Mr. Parker's account of the formation of the drum is somewhat conflicting: thus in figure 9, plate xxix. (embryo two thirds of an inch long), he describes a growing outward from the wall of the ear sac of the lining skin of the cleft to meet a growing inward of the same lining skin from the outer face; the union of these growths forming the drum. In figure 5, plate xxxii. (embryo one and one third inches long), we find the drum consisting of two epithelial surfaces inclosing a thick layer of connective tissue, in the midst of which the long process of the hammer is imbedded; the text contains no explanation of the occurrence of the bone and connective tissue between the two epithelial surfaces that were just about uniting to form the drum in an embryo two thirds of an inch long.

It has seemed to me impossible to reconcile the description of the formation of the meatus externus with the appearances which are shown in the plates. In figure 9, plate xxix., we see that the formation of the drum would leave the meatus a large inclosed cavity with no communication outwardly; in figure 5, plate xxx. (embryo one inch long), we find the meatus figured as a depression on the surface; and in figure 5, plate xxxii. (embryo one and one third inches long), this depression has extended still deeper, so that, as is seen in figure 5 of this plate, it extends underneath the outer section of the Eustachian tube. It is difficult to imagine any connection between the structure referred to in plate xxix. and that, which is really the meatus, shown in plates xxx. and xxxii.

The description of the formation of the Eustachian tube is equally contradictory: thus referring again to figure 9, plate xxix., it will be seen that the tympanic cavity is described as partitioned off from the

meatus by the formation of the drum, and that it has no communication with the pharynx. On page 302 (referring to figure 5, plate xxx.) the first description of the Eustachian tube is given as follows: "The dark, jagged space is the tympanic cavity, a development of the first post-oral cleft, which runs forward into the mouth cleft as the Eustachian tube." This description would lead us to think that the Eustachian tube grows downward from the middle ear cavity to the pharynx.

If we analyze the opinions cited we shall find much that is contradictory and much that is impossible. Huschke's view, as originally stated by him, had the merit of being easily understood and of appearing very plausible; so plausible, indeed, that most writers since his time have endeavored to torture the facts as they observed them into an accordance with his descriptions. Thus Valentin in 1835 believed that the Eustachian tube was a part of the first cleft, and is confused concerning the development of the meatus, etc.; in 1847 he describes the bottom of the little depression, which we have shown<sup>1</sup> becomes the concha, as the drum. Rathke, after giving various descriptions, settles in 1861 upon the views of Huschke. Kölliker gives Huschke's views, but we find some striking inconsistencies in the old and new editions of his work: thus in the old edition he states that the ossicles are formed (in cartilage) at the end of the second or the beginning of the third month, yet he derives them from the first and second branchial arches; surely there can be no talk of branchial arches at this stage of development. Farther he correctly describes the ossicles as forming in the connective tissue above the tympanic cavity, and the cavity as a section of the proximal end of the first fissure; now these very descriptions locate the ossicula in the head-plates at a point midway between the line of the first and second arches. We have noticed apparent inconsistencies in the new edition.

Schenk recapitulates the mistake of Valentin, made in 1847. Mr. Parker's errors are the most striking, since he repeatedly speaks of the interior of the auditory sac, which you will remember forms the cochlea, canals, and vestibule, as the first fissure.

So many and such eminent observers could not have erred upon a point of such simplicity unless some general cause existed that gave rise to their confusion. I believe there is one principal cause, namely, the embryos used in their observations were too far advanced in their development. The embryos which we show this evening as a series illustrating the growth of the auricle, a part so late in its development, are with one exception younger than the youngest which Mr. Parker describes in this connection.

The view which we have heretofore stated<sup>2</sup> is in the main that which

<sup>1</sup> Amer. Jour. Med. Sci., January 1, 1877.

<sup>2</sup> Report of First International Society, September, 1876, and American Journal of the Medical Sciences, January, 1877.

Von Baer advanced in 1828, namely, that the Eustachian tube and middle ear are formed by an involution of the pharyngeal mucous membrane; that the meatus externus is an involution of the integument; that the drum is cut off, as it were, by the former involution overlapping the latter; and that the membrana propria of the drum is the connective tissue included between the tube and the meatus. I will not trouble you with details already published, but would call attention to the fact of their priority, since Dr. Urbantshitch, as I learn from a review in the *Archiv für Ohrenheilkunde* (Bd. 12, Heft 4), has recently

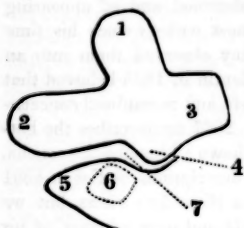


FIG. 1.—1, Superior maxillary process of first branchial arch. 2, Inferior maxillary process. 3, Root of arch. 4, The angle, at junction of proximal and posterior borders, forming ridge (1, Fig. 2). 5, Second arch. 6, Round nodule which forms posterior portion of auricle (2, Fig. 2). 7, The slit (3, Fig. 2).

published the same facts as discoveries of his own. The review referred to states that Dr. Urbantshitch could find no perforation in the embryonic drum to account for the Rivinian foramen, which has furnished so much material for anatomical discussions. I have seen no perforation, but have supposed that the foramen is, when it occurs, an accidental defect, such as is often seen in such secondary structures as the tissues in which it is located. Meckel's cartilage is attached to the cartilaginous hammer, and only after its absorption does that part of the drum which covers its site form; in this structure I believe that we meet with a Rivinian foramen for the same reason that we often meet with congenital umbilical hernias. The imperfection in the annulus tympanicus has the same causation.

One point I wish to illustrate a little more in detail, since I believe that it has never been demonstrated. I refer to the formation of the auricle. I have made these rough sketches and brought embryos of nearly the same period of development as those from which the sketches were made to illustrate a matter that is difficult to describe without such aids. Nothing more specific has been said upon this point than that a ridge of skin forms the auricle. Kölliker, in 1861, said that the auricle forms at the end of the second month (human). I believe that he merely notices the completion of a very interesting process, which, as it occurs on the surface, you can observe for yourselves upon these embryos. There is a small, circular elevation upon the second bran-

chial arch. Meckel's cartilage is attached to the cartilaginous hammer, and only after its absorption does that part of the drum which covers its site form; in this structure I believe that we meet with a Rivinian foramen for the same reason that we often meet with congenital umbilical hernias. The imperfection in the annulus tympanicus has the same causation.

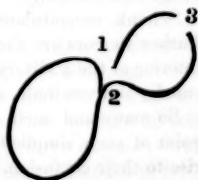


FIG. 2.—1, Anterior median portion of auricle. 2, Apex and posterior portion. 3, Slit which occasions irregularity in helix.

chial arch of an embryo one half an inch long (fifth or sixth week of human embryo, or perhaps still younger). (See Figure 1.) By continuing the observations through various stages of growth I find that it is the origin of the thick ridge which forms the posterior portion of the auricle, while the angle made by the junction of the proximal and posterior borders of the first branchial arch forms another ridge that gives origin to the anterior superior portion of the auricle. (See Figure 2.) These structures are situated, respectively, upon the second and first branchial arches; in an embryo nine sixteenths of an inch long these arches are fused excepting at the point at which the auricle is forming, and here the opening is entirely superficial excepting at the very uppermost part of the future auricle; here a slit remains as a trace of the first cleft. I now believe that the opinion expressed in the *American Journal of the Medical Sciences* last January is correct, and that this slit is the cause of the little irregularity in the helix which we notice particularly in young children.

The connection between the formation of the auditory ossicles and the occurrence of the mastoid cells, which I described at the same time (January, 1877), is also interesting, since it furnishes a cause for that strange structure, the mastoid process. In looking for an intelligent purpose in its creation we shall find but little to satisfy us; the cells appear to be useful only as the appendix to the cæcum is, to furnish troublesome and sometimes fatal complications in diseases. While the connective tissue about the site of their formation is developing into dura, skull, and muscle, that in their immediate neighborhood is undergoing interesting changes: fewer cells are produced in it, so that its appearance is more that of a net-work and less that of compact tissue; the processes of the individual cells are long, and make up an important part of the substance of the connective tissue in this neighborhood; the energy that belongs to the part seems to be expended mostly in the formation of the ossicula; at a later period the ossification of this spongy connective furnishes the thin laminae of bone that bound the mastoid cells.

NOTE. — The early development of the Eustachian tube may be studied by making sections a little anterior to the otic vesicle; the section should cut the first branchial arch obliquely, from above, downward and forward. Continuing the sections posteriorly we shall obtain instructive views of the development of the otic vesicle (that is, internal ear), since the Eustachian tube is nearly parallel to the curve of the non-spiral cochlea; later, when the spiral forms, the tube is nearly parallel to the curve which would bound the inferior border of a plane bisecting the cochlea into anterior and posterior halves.

## EPITHELIOMA OF THE LACHRYMAL GLAND.

BY J. CHESTER LYMAN, M. D., SAN FRANCISCO.

THE following peculiar case occurred last spring in the practice of Dr. Henry W. Williams, during my service under him at the Boston City Hospital, and he kindly consented to my reporting it.

Daniel B., a clergyman, thirty years old, entered the hospital on the 8th of May with the following history:—

Two and a half years previously he began to be troubled with considerable neuralgic pain throughout the left side of the forehead, and extending downward into the corresponding eyeball. A little later he received an accidental blow upon the same eye, and a few weeks afterwards slight protrusion of the globe was noticed. The exact dates were not to be obtained, but all this was within two or three months of the beginning of the pain.

At the time of admission the exophthalmos occasioned great deformity, the globe protruding nearly half an inch beyond its normal position; vision was perfect, and the pain but slight, having materially diminished during the past two years, and having been intermittent in character. By the touch a tumor, the size of which could not be determined, was detected in the neighborhood of the lachrymal gland, and was evidently the cause of the protrusion of the globe.

Ether having been administered an incision an inch and a half long was made just below and parallel with the middle and outer portion of the arch of the orbit, and the entire growth was removed. To accomplish this the excavation had to be carried to the depth of an inch and a quarter, the tissues being separated in a great measure by a director, and the use of the scalpel avoided as much as possible. There was very little hæmorrhage after the operation; suppuration was slight, and the discharge was encouraged by keeping the wound open by means of a pledget of lint. For a fortnight there was a good deal of œdema of the lids and conjunctivæ, but this gradually diminished, and four weeks after the operation the patient was discharged nearly well, a small amount of diplopia and local swelling remaining.

The tumor removed from the orbit was an inch in length by one half to five eighths of an inch in other diameters; it was irregular in shape, and not of very hard consistence. Dr. Fitz examined it microscopically and found it to be an epithelial cancer, and, though glandular tissue was not satisfactorily demonstrated in the tumor, the following facts point to the lachrymal gland as the locality in which the disease commenced:—

The epithelial nature of the cancer indicates that the tumor sprang from an epithelial surface. Now there was nothing superficial in this



growth; it was deep seated, and neither on the skin nor the conjunctiva was there any sign of disease. It was in the immediate neighborhood of the lachrymal gland, from which it is possible for it to have arisen, and at its depth and locality it could have started from nothing but this gland.

It is reasonable, therefore, I think, to suppose that the growth involved the entire gland, and so far destroyed it as to prevent its recognition; otherwise we must consider that this tumor, arising from the gland, spread into the surrounding tissue. But this idea is incompatible with the great care taken to remove every particle of tissue at all hard or lumpy to the touch, and the fact that no glandular structure was found.

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### RECENT PROGRESS IN OPHTHALMOLOGY.

BY O. F. WADSWORTH, M. D.

*Primary Lupus of the Conjunctiva.* — Neumann<sup>1</sup> observed a case of this rare affection in a girl of twenty-two years. Five years before, a tumor of the size of a pea appeared in the inner angle of left eye, which was opened, suppurated several months, and then cicatrized. A few months later isolated, readily bleeding elevations appeared on the conjunctiva of the lower lid. A physician diagnosed lupus, and repeatedly removed and cauterized the growths, but the disease spread to the globe and upper lid, both lids became attached to the globe, and sight was lost. Three years after the trouble commenced in the conjunctiva nodules developed in the upper lip and the lower part of the nose.

Neumann found the tip and alæ of the nose drawn in and covered with scales and nodules. The left eye was shrunken, with a shallow depression in the position of the cornea. A portion of the edge of either lid had lost its lashes, was contracted, incurved, and attached to the globe by short, dense symblepharon. The inner surface of the lids, so far as it could be seen, and the surface of the globe were covered with dense, grayish granulations, over and between which projected ragged, easily bleeding excrescences. This tissue consisted of an infiltration of small round cells imbedded in a firm meshwork, and containing numerous capillary vessels. The epithelium of the conjunctiva was hypertrophied, and plugs of epithelial cells projected backward as in epithelioma, while the deeper layers of the conjunctiva contained also giant cells, generally collected in groups.

*Transplantation of the Cornea.* — In 1824 Reisinger published an account of successful transplantation of a portion of cornea from one rabbit to another, and in the following years his experiments were re-

<sup>1</sup> Wiener med. Presse, No. 293, 1877.

peated and modified by others, several succeeding in obtaining union of the transplanted piece, some even claiming that it remained transparent. In a few instances, also, transplantation of the rabbit's cornea to man was effected, but without preservation of its transparency. Ignorant of these earlier attempts, Dürr<sup>1</sup> transplanted, in some twenty cases, slices of cornea from one rabbit to another. The pieces transplanted were five to eight mm. long, five to six mm. broad, and about one mm. thick, consisting of a layer of corneal substance covered with epithelium. The refreshed surface on which they were placed was somewhat smaller than this, to allow for shrinkage. On the peripheral parts of the cornea the transplantation always succeeded, never on the more central parts. It was found to be best to remove with the slice of cornea to be transplanted a narrow strip of scleral tissue and a conjunctival flap some four mm. long; then at the edge of the refreshed surface prepared for the reception of the slice, to dissect up the conjunctiva and secure the conjunctival flap beneath this by a fine suture. The slice having been placed in proper position, the lids to be closed by a suture.

The operation is followed by but little reaction, and attachment is generally effected by the second day. The epithelium of the transplanted piece unites during the first days with that of the edges of the wound, and does not change afterward. The transplanted corneal substance becomes at first thickened and opaque; after a few days superficial vessels develop into it from the conjunctiva, then deeper vessels into its substance, and about the end of the first week the vascularization is sufficient to give to it a reddish color. Next, while the deeper vessels progress, the corneal substance takes on a more yellow tinge, at first in spots, then more uniformly, and swells more, so as to appear as if undergoing suppurative destruction. After the second week, however, these changes diminish; swelling, opacity, and vessels recede. Generally, in six weeks assimilation is complete. Then there remains only a slight line of cicatrization bounding the transplanted flap. The flap itself is as transparent as the rest of the cornea and of like curve.

The success of these experiments led to similar operations on the human subject. The first patient was a boy of ten years old, a pupil in a blind asylum, whose eye was leucomatous. A slice of cornea five mm. in length and breadth was transplanted from a rabbit. The course of the healing was as above described in the rabbit, and in two months the transplanted piece appeared as an island of uninjured corneal substance in the leucoma. The cornea resembled a piece of ground glass on which a spot had been made transparent by a drop of oil. The boy, who had previously been able to distinguish only light and darkness, could now distinguish large objects and find his way about.

Six other cases were operated on: two on account of leucoma, two

<sup>1</sup> *Klinische Monatsbl. für Augenheilkunde*, September, 1877.

for dense corneal opacities, one for perforating ulcer of the cornea, and one for the cure of a peripheral corneal ulcer which refused to heal under other treatment. The flaps transplanted were six to twelve mm. long and six mm. wide. In all but the last case was the transplantation successful; in that want of success is attributed to the restlessness of the patient. In the case of perforating ulcer there was a prolapse of the iris of the size of a hemp seed, yet the flap united as in the other cases, though there was no corneal tissue beneath it. Even on the twelfth day the flap was quite transparent, and the changes in the floor could be seen through it, as well as the diminution of the prolapse to the size of a pin's head. But these last six cases were not sufficiently advanced to give definitive results when Dürre wrote his paper. He believes that, though the number of cases is small, they are yet sufficient to give a firm basis for farther endeavor, and that the method offers a means of improving vision in a class of cases hitherto unbenefited by treatment.

A case of corneal transplantation is also published by Power,<sup>1</sup> of London, even more remarkable than the above cases. A man of sixty-one years was admitted to hospital in October, 1876, with ulcer of cornea, hypopion, and iritis. The hypopion was removed by incision but ulceration increased, with bleeding into the anterior chamber and obliteration of the pupil. The latter part of November iridectomy was performed. March 20, 1877, another iridectomy was attempted, but it was possible to remove only a small piece of iris and a portion of exudation from the anterior chamber. There was only quantitative perception of light. On April 8d, cornea, iris, lens, and a small amount of vitreous were removed. A transparent cornea with narrow border of sclerotica taken from an eye just before enucleated from another patient, and meanwhile preserved in a tepid five per cent. solution of salt, was then placed on the stump and fastened by six silver sutures. For three days there was great pain; on the fourth the eye was opened; the cornea was clear, except for a cloudy crescent at its lower edge, and there was perception of light. A week after the operation the cornea appeared somewhat cloudy, but was completely attached. During the next two weeks the cornea became more opaque and slightly shrunken, while two small ulcers formed on its lower part, but again healed. The eye was remarkably free from sensitiveness. Tension was somewhat diminished. Perception of light remained. April 27th the patient left the hospital. On June 1st the transplanted cornea was pretty clear; a false membrane crossed the anterior chamber. Tension was nearly normal, and the eye perceived movements of the hand. By the 25th of June, however, there was only perception of light, and the cornea had become again more opaque and somewhat shrunken.

*Healing of Wounds of the Cornea.* — Wyss<sup>2</sup> studied on rabbits the

<sup>1</sup> *Centralblatt für pract. Augenheilkunde*, July, 1877.

<sup>2</sup> *Virchow's Archiv*, lxi. 1.

method of healing of incised wounds of the cornea. If the wound does not extend through the whole thickness of the cornea it is, in its whole depth, filled by a proliferation of the corneal epithelium by the end of one or two days; and the great importance of the epithelium in the healing process is farther evident from the fact that if the wound be made in the midst of a surface from which the epithelium has been removed it continues to gape till the epithelium has been reproduced and extended into it. When the wound is a penetrating one its anterior two thirds is filled by epithelium, its posterior part gapes, there is an incurvation of the membrane of Descemet at its edges, and the posterior layers of the cornea, owing to the action of the aqueous, become somewhat swollen. A finely granular substance, a deposit of fibrine from the aqueous, fills the posterior part of the wound. Neither in this case nor when the wound is made from the anterior chamber outward, either into or through the cornea, is there any proliferation of the endothelium lining Descemet's membrane into the wound. From the fourth day begins a change in the epithelium filling the wound, and it is replaced by a meshwork of fine fibres containing numerous nuclei, while in the neighboring corneal substance appear many spindle-shaped bodies which seem to be connected with the corneal corpuscles. Later the cicatrix consists only of a meshwork of fibres, and gradually decreases. The presence of round cells in the corneal tissue about the wound is not a necessary part of healing by first intention; it is a symptom of inflammation, and only impedes the healing process.

*Ophthalmoscopic Appearances in Insanity.* — Klein<sup>1</sup> reviews the varying and contradictory results of different observers in this field, and attributes their discrepancies in part to the fact that most of them used only the reversed image. Klein himself examined one hundred and thirty-four insane patients with the upright-image and weak-light mirror. Atropine was used in about one half of the cases. Among the cases were forty-two of general paralysis, nineteen of mania, nineteen of epilepsy, seventeen of alcoholismus, etc. Positive changes were found in eighty-nine cases; the result of examination was negative in twenty-seven, doubtful in eighteen.

But the significance of this large proportion of changes in relation to the statements of other observers is modified when the nature of the changes is considered. Such alterations of the fundus as have been reckoned as positive by others were found only in thirty-one cases: in nine retinitis, in eight discoloration of the papilla, in six atrophy of the opticus, and in eight hyperæmia of the retina. Of the remaining fifty-eight, twenty-nine presented indeed variations from the normal standard as to the form, color, or boundary of the disc, the size or distribution of the vessels, but these anomalies could not be placed in any definite

<sup>1</sup> Wiener med. Zeitung, 51, 1876. Wiener med. Presse, 2, 1877.

category of disease, were mostly of development, few acquired, and were distributed in nearly like proportion among all the forms of insanity observed.

Finally there were twenty-nine cases which offered ophthalmoscopic appearances sufficiently definite to be described together. These appearances consisted first in a lack of transparency of the retina similar to that which occurs as a senile change in every normal eye, but of greater degree, and not here to be regarded as simply senile, since comparatively young individuals were the subjects of it; second in a peculiar affection of the walls of the retinal arteries (sclerosis, fatty degeneration, or some other process), which was evident as an interrupted widening of the arteries, while the central reflex remained of the same breadth.

Since eighteen of the twenty-nine patients in whom this change was observed were the subjects of general paralysis, and it occurred in a large proportion of all the cases of general paralysis (eighteen to forty-two), Klein proposes, for want of a better name, that of retinitis paralytica. The described change cannot be considered as characteristic of progressive paralysis, however, since it was found, though in a very much smaller proportion of cases, in several other forms of insanity. It is possible that this diminished transparency of the retina may be due to like alterations to those which produce senile degeneration, and thus point to an early general senile metamorphosis dependent on the progressive paralysis. But there appears more reason to regard the affection as offering the same evidence as a symptom as does the diffuse retinitis which occurs with various cerebral diseases, and especially with progressive paralysis, that is, as pointing to an affection of the cortex cerebri.

Embryological as well as histological investigations (Meynert) show that the retina is a portion of the cortex cerebri, and the opticus is not a nerve proper, but a process of the cerebral medullary substance. While, then, several writers have found in general paralysis the cortex cerebri to be the seat of an inflammation resulting in regressive metamorphosis, or of regressive metamorphosis primarily, there is nothing surprising in the fact that the retina, as a part of the cortex cerebri, should participate in such inflammation or degeneration. According to this reasoning any affection of the retina must awaken suspicion of disease of the cerebral cortex.

In marked contradiction to the results of some other authors, Klein found among the cases of progressive paralysis only two with atrophy of the opticus, and other two with bluish discoloration of the disc, an indication that implication of the medullary substance is rare in this disease. On the other hand, in epilepsy, the opticus was found twice as frequently involved as in general paralysis, the retina rarely affected,

so that in this respect a contrast may be drawn between the two diseases. In one case observation during an epileptic attack showed ischemia of the retinal vessels and clonic spasm of the pupil.

For the differential diagnosis between general paralysis and chronic alcoholismus, very difficult in some cases, the ophthalmoscope gave no assistance.

(To be concluded.)

## PROCEEDINGS OF THE OBSTETRICAL SOCIETY OF BOSTON.<sup>1</sup>

C. W. SWAN, M. D., SECRETARY.

DR. CHADWICK remarked that it would seem to depend greatly upon the size of the children. In the hypothetical case just given he would favor a resort to version as the most feasible means of delivery.

DR. ARNOLD mentioned a case of twins with shoulder and arm presentation, the arm protruding from the vulva.

*Ante-Partum Hour-Glass Contraction of the Uterus.* — DR. HOSMER reported the case, which he had seen in consultation. The patient was a primipara; short, stout, and thirty years of age. She had passed her full time, had been in labor seventy hours when Dr. Hosmer was called, at ten or eleven o'clock P. M. At this time the pains were less frequent and strong than they had been; the general condition was fair. The forceps had been tried. The pelvis was narrow, the pubic arch contracted, and the promontory of the sacrum very much advanced. The occiput lay towards the right acetabulum and thrown very far forwards over the pubic bones, the head forming a prominent mass externally. The os was well dilated and out of the way; the parts moist and of good temperature. Another attempt was made with the forceps. They were got on without much delay, but slipped off posteriorly, the forward position of the head — anterior to the axis of the superior strait — preventing an equatorial application. Next, version was attempted. The hand was carried up with difficulty; the left foot was seized and brought into the vagina. No force thus applied could change the position of the child. A loop of tape was then passed around the limb, and traction strongly made with it until the yielding of the tissues compelled an abandonment. Then the head was opened and emptied of its contents, and the forceps applied to the diminished mass, but neither this nor traction on the head by the ordinary instruments resulted in the least progress. It was next determined to seize the other foot, in process of which an unexpected difficulty presented itself. A powerful uterine constriction was discovered. The ether, under the moderate influence of which the patient had hitherto remained, was now pushed to its utmost. The hand was carried up gently, steadily, perseveringly, and the pelvis of the child was found firmly grasped by a powerful uterine constriction sharp and distinct, with well-defined edge, in the cavity beyond which the right foot was reached with difficulty. After a prolonged effort this foot was

<sup>1</sup> Concluded from page 424.



brought down to the rim of the pelvis, but could be got no further. A loop of strong tape was then carried up over the hand and made fast to the leg; after a considerable time version was at length accomplished, and a female child, weighing six or seven pounds, was delivered. The woman died seventy-two hours afterwards.

Dr. Hosmer stated in addition, in answer to questions, that he did not observe whether it was possible to detect the constriction externally. This condition was not discovered in the search for the first foot, which lay below it. Traction was made at right angles to the plane of the superior strait. Dr. Hosmer stated that he had never before met with an ante-partum hour-glass contraction.

Dr. FIFIELD said he had frequently been unable to deliver by traction in the direction of the axis of the superior strait, while he had succeeded very easily with a forward traction, making the occiput slide along the pubic surface, and he had practically adopted this method.

Dr. HOSMER remarked in reply to questions that the antero-posterior diameter was narrow and the head was resting on the top of the pubis. He thought that the only possible objection to turning in such case was the risk of injury from the sharp edges of the cranial bones. He would say that in the case of version resorted to after an unsuccessful craniotomy, the risk of damage from the edges of the cranial bones is so small that it practically amounts to nothing by reason of the protection afforded by the scalp, and it certainly could be determined beforehand whether there were in the artificial foramen any projecting point or angle which would expose the soft tissues of the mother to laceration and injury.

Dr. SINCLAIR said that he had had a case similar to that of Dr. Minot, — the corrected report of which not having been received is for the present omitted from the record, — with the same result. The chief difficulty in the way of turning was the rigidity of the uterus. The trailing scalp covered the bones sufficiently well. The patient, however, had become exhausted at the time of his arrival, and died soon after delivery.

Dr. ARNOLD related a case of which he was reminded by that reported by Dr. Hosmer, in which death occurred at the third confinement. The first labor, four years previous, was very tedious; ether was employed, and the pains were apparently good, but there was no advancement. The forceps were applied, but the head, which was at the superior strait, could not be displaced. Dr. Arnold then proceeded to turn, and found high up a constriction in the form of a large, firm band, beyond which were the pelvis and lower extremities of the child. It was with a good deal of difficulty that the hand could be got beyond this constriction, which then almost paralyzed the hand in its firm grasp. After a long time the feet were brought down, and there was then trouble in turning, but this was ultimately accomplished, and the child was delivered.

At the second confinement, on the attempt being made to turn by the feet the same contraction was found, but the result was finally successful, as before.

On the third occasion there were proper pains and full dilatation, yet no progress.

Dr. FIFIELD asked what, in the opinion of members, was the best form of

instrument for crushing the bones of the skull together. He had never used anything but the crotchet, and his objection to that offered for sale in the shops was that the hook is very blunt, and the shaft too semicircular in outline, whereas there should be a reversed curve forwards of the shaft, so that the crotchet can enter the bone and hold. The cephalotribe and cranioclast are said to be superseded; he would ask, by what?

DR. RICHARDSON said that the cranioclast, whose blades both curve in the same direction and are in continuous contact when closed, was intended to grasp with one blade external the other internal to the cranium, and was therefore a simple tractor; the cephalotribe, grasping with both blades external and with opposed curves, was both tractor and crusher; while a third instrument is tractor, crusher, and cutter. The first is preferable, as allowing the head to mold itself to the parts; the second is objectionable, since compression in one direction causes expansion in the opposite; while the third instrument is open not only to the objection stated, but to the additional one of risking the firmness of the hold by its cutting property. The internal blade of the cranioclast should be introduced through the opening made with a trephine.

DR. SINCLAIR described as follows the cephalotribe he was in the habit of using, and which he obtained in Edinburgh in 1868; he believes it to be a modification of Simpson and Martin's instruments by a Dr. Charles. It is essentially English in its construction as compared with the continental. It has two double-curved blades, fenestrated at the distal end to the extent of one third the length of the blades, and serrated on the inner aspects. It locks by means of a button and groove, like some midwifery forceps. The handles are covered with wood, with short projections at the distal ends to facilitate traction, and are approximated by a powerful fine-threaded screw.

DR. CHADWICK said that the cephalotribe was liable to force the bones of the cranium through the scalp, thus endangering the maternal surfaces.

*Prolapse of the Cord; Restoration.* — DR. ABBOT stated that he had once succeeded in returning a prolapsed cord in the manner detailed by Dr. Minot at the previous meeting. The case was one in which there was a large amount of liquor amnii, and when the membranes were ruptured the rush of this fluid brought down a handful of the cord into the vagina. He had little difficulty in replacing the whole of it with his hand within the uterus, and keeping it there until the contraction of that organ was sufficient to bring down the head, so as to prevent a repetition of the prolapse, the patient lying on her back.

*Peri-Uterine Abscess; Hæmatocele; Rupture of Abscess into Pelvic Cavity; Peritonitis; Death.* — DR. SINCLAIR read the account from notes prepared by Dr. Damon, in whose practice the case occurred.

December 7, 1873, one P. M. Mrs. N. J. F., aged twenty-three years, mother of two living children, has been treated for rheumatism by an irregular practitioner during the past few days. Has taken potassium acetate. About three weeks ago had some pain low down in right side of abdomen. Wet feet three days before. Since then has had pain in abdomen down to pubes. Is distended by flatulence; no appetite for three days; retention of urine for three days, or suppression; white fur on tongue; pulse 116; singultus, and sudden attacks of flatulent colic; insomnia.

Ry Elixir potassii bromidi 3℥. nocte.

Ry Willow charcoal q. s.

Ry Tinct. opii deodoratæ gtt. xx in aq. t. d.

Ry Lime water and milk.

December 8th, 9.30 A. M. Took only two teaspoonfuls of elixir and ten drops of opiate three times. Awake all night; distended by flatus. Pulse 112; skin natural; white fur on tongue; pain in abdomen; frequent eructations; no dejection for two days, then small and from injection; scybala; passed urine this morning. To have one fourth of a grain of sulphate of morphia on tongue.

11.30 P. M. Pulse 88. Skin cool and moist. Has had three soap-suds injections, and three thick, semi-solid discharges. Took twenty drops of deodorated tincture of opium at eleven A. M. and six P. M. Tongue is red at tip and with white fur near base. "Dreadful pain" in epigastrium. Face moist and cool. Nausea. Has drunk considerable quantity of water and vomited. Hands of a dull red or scarlet color, extending up wrists. Legs cool and moist. To have aromatic spirits of ammonia as occasion requires.

December 9th, 12.17 A. M. Singultus. Sinapism to epigastrium.

One A. M. Pain severe. To have one fourth of a grain of sulphate of morphia on tongue.

12.30 P. M. Temperature of axilla  $98\frac{1}{2}^{\circ}$ ; of hand  $96\frac{1}{2}^{\circ}$ .

9.30 P. M. Pulse 108. No pain. Takes beef tea and ale. Less flatulence

December 10th, 12.45 P. M. Pulse 112, irregular. Respirations 28.

5.30 P. M. Pulse 120. Respirations 32, irregular and sighing. Eyes upturned. Gave injection of beef tea and brandy. Patient died December 11th, two A. M.

Post-mortem examination the same evening. Nearly eight quarts of serous fluid in abdominal cavity, recent. Hæmatocele of right ovary, size of English walnut. Clot of blood. Opening into pelvic cavity, posterior and to right of uterus, admitting two fingers. Remains of an abscess containing some greenish pus. An ounce or more of pus in pelvic cavity. Interior of pelvis red and vascular. Puncture through fundus of bladder which would admit of the passage of a No. 9 catheter.

Previous to Dr. Damon's attendance a No. 9 catheter was passed with the wire in, followed by severe pain and a wine-glass or two of clear blood. He was not informed of the fact until the puncture was discovered

The pelvic abscess had probably existed three or four weeks at least. Peritonitis appears to have begun about six days previous to death. The abscess in this case was in the cellular tissue lying below the broad ligament.

*Labor complicated by Cancer of the Cervix Uteri.* — DR. FIFIELD reported the case. The patient came into his hands in consultation, after having been in labor forty-eight hours. At this time there had been no effective pains, but they were beginning to increase. The os was of the size of a quarter of a dollar, ragged, ulcerated, fungous, and bleeding, the cancerous growth extending to the rectum. The waters had drained off. The forceps were applied and, with slight traction, a living child was delivered. There followed a jet of arterial blood, which, however, soon ceased. The placenta followed naturally. Both the mother and child did well. Dr. Fifield remarked that Dr. Robert Lee relates a few such cases.

*Criminal Abortion.* — DR. FIFIELD stated that he had been called to a patient who had just miscarried at four months. He found the fœtus, membranes, and placenta entire among the dirty clothes. The woman confessed that it had been done wholly by the use of the finger at two visits.

DR. LYMAN stated that he had seen two or three cases from an operator, who was said to have employed in them the finger alone.

DR. LYMAN reported the case of a young married woman, who had had one child, and who, while under treatment for uterine disease, was found to be pregnant again. The physician in attendance, in view of her bad condition of health, thought it best to induce miscarriage. When Dr. Lyman saw the patient, some days subsequently, he was told that the whole thing was over, and so, from the absence of symptoms and from vaginal examination, it appeared. Four days later he found her pulseless from loss of blood, and for twenty-four hours her condition was very critical. The placenta had not been removed. Dr. Lyman stated that he had never before seen hæmorrhage so copious so long after a supposed miscarriage, with absolutely no uncomfortable or suspicious symptoms in the interval. He thought that there was always something, on careful examination, to arouse suspicion in case the placenta had not come away.

DR. RICHARDSON mentioned the case of a patient who was seen at the outpatient department of the Massachusetts General Hospital. She was reported to have miscarried at four months, and in four or five days had been up and about. Two weeks later there was flowing, and this continued, with occasional intermissions, until she came to the hospital. An examination showed the placenta to be still retained. This was removed and the flowing ceased. The placenta had been retained about three months. It was shriveled up and rolled into a rounded mass.

DR. SINCLAIR asked whether in cases of postponed discharge of the placental mass the event generally occurred with a good deal of hæmorrhage. He said that it was always his custom to tell such patients that the delay made no difference; that the placental mass would come some time or other, and with hæmorrhage; and he gave instances in which the placenta had been delayed five, six, and eleven days with such result.

DR. ABBOT, *per contra*, gave the following case: A woman was recently admitted to his ward in the hospital who had miscarried six weeks before, and had continued to flow during the interval. She was very anæmic from loss of blood, and had been sent to the hospital under the impression that a portion of the placenta had not come away. No trace of it, however, could be detected. She was treated for hæmorrhage, which shortly ceased, and remained under observation for several weeks. No placenta came away.

DR. ARNOLD inquired of the members present what their feeling was as to the use of the placental forceps in removing detained masses, and stated that he had never seen any ill effects from the use of Loomis's forceps, of which he had had occasion to speak at a former meeting.

DR. SINCLAIR said he preferred the fingers, and plugging the vagina, repeatedly if necessary, the placenta being ultimately thrown out upon the tampon.

DR. BIXBY said, in reply, that he thought the instrument serviceable when the placenta did not adhere, but in many cases the forceps effected only fragmentary detachment, and in these the finger was better.

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### THE MEDICO-LEGAL SOCIETY.

WE announced some months ago that the medical examiners of Massachusetts were preparing to form a society with the above title, and we are happy to congratulate them on having accomplished their undertaking. The society was duly organized on October 1st. The regular members must belong to the State Medical Society, and we believe forty-four from about sixty have joined. Associate members, who have no vote, comprise the attorney-general and the district attorneys, and also "persons versed in medical, legal, or technical science." The discussions cannot, we think, fail to be both interesting and valuable, and we trust will have a good effect on our system of expert testimony which, now that the coroners have fallen, is one of our most crying abuses. The society, we understand, does not mean to confine itself to discussion, but to look after the conduct of the medical examiners, and to use all honorable influence to prevent the appointment of incapable or unworthy persons to fill such vacancies as may occur. There is a board of censors who constitute an election committee, and may bring charges against members for misbehavior.

The society contains excellent material, and we are glad that the examiners feel the necessity of keeping up their present standard. Let them remember that they have the eyes of the community upon them, and that all the respectable part of it trusts to them to make impossible any return of the abuses which disgraced their predecessors. Perpetual vigilance in such matters is necessary, as we believe we have remarked once or twice already.

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### THE SURVIVAL OF THE FITTEST.

THE *American Journal of the Medical Sciences* has reached the respectable age of fifty years. It is the continuation of the *Philadelphia Journal of the Medical and Physical Sciences*, established in 1820. The *Edinburgh Medical Journal* is the only one in our language now published that appeared before the last-mentioned date. The *Lancet* appeared in 1822. The *Boston Medical and Surgical Journal* began with its present name in 1828, only a few months after our Philadelphia contemporary, being formed by the fusion of the *New England Journal of Medicine and Surgery* (started in 1812) with the *Boston Medical Intelligencer*. The *London Medical Gazette*, which about twenty-five years later united with *The Times*, began in December, 1827. We have nothing to say of our own merits; we leave self-praise to those cheaper journals that must choose between it or none, but we may say of our above-mentioned contemporaries that they are a striking illustration of the law that we placed at the head of these remarks.

*The American Journal of the Medical Sciences*, being a quarterly, has rather a different scope from any other in the country, and it is perhaps to this that its well-deserved success is largely due. It has no editorial department, does not have to discuss medical politics, and consequently devotes itself solely to the science and art of medicine. Appearing quarterly, it is not a rival of those journals that are published more frequently. It is universally acknowledged to be the leading American medical journal, and in our opinion is second to none in the language. The editor, Dr. Hays, may well feel proud of his work during the last half century. Until 1869, when his son was associated with him, he did the work alone. It is probable that in the future he may take a less active part in the management, but we trust that for many years he will continue to rejoice in the reputation which his editorial labors have won him.

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### THE MEDICAL SOCIETY PRIZE.

It appears that the committee on publications of the Massachusetts Medical Society has offered a prize of two hundred dollars for the competition of members. The essays must be sent to Dr. Shattuck on or before the 15th of next April, and are to show "original or meritorious professional work" done during the two years preceding that date. We are always glad to welcome a new prize, but it seems to us that the time allowed for this one is of the shortest. Perhaps the object of the committee is not so much to stimulate work as to bring out what is going on in the minds of members, for six months may be sufficient to complete investigation already begun and to arrange the conclusions. It must be a very young man who would have the courage and enthusiasm to begin now a fresh subject, and we fear he would stand little chance of success. If the idea of the committee is not what we have suggested we are quite at a loss to imagine why a longer notice was not given. Should the prize be won by some paper of exceptional merit, the wisdom of the plan will be apparent as showing in a striking manner of what excellent material the society is composed. We trust this may be the result.

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### MEDICAL NOTES.

— For some surgical purposes, Dr. W. M. Chamberlain recommends in *The Medical Record* for September 29, 1877, the use of gutta-percha tissue, which is now made in sheets about a yard wide, and as thin as fine French writing paper. It is unaffected by the heat of the body, but softens at a somewhat higher temperature. It is insoluble in water, but soluble in ether, chloroform, and alcohol. Dr. Chamberlain advocates its employment as a substitute for plasters of all kinds in wounds or lesions of the hands. For instance, a cut upon the finger may be treated by winding smoothly a narrow ribbon of the tissue around it. A lighted match passed just above its surface will seal the band by fusion and leave a neat, light, clean, and impervious cover to the wound. So if a broad patch of abraded skin is to be shielded from the air, a



piece of the tissue somewhat larger is laid upon it and sealed in position by tracing the margin with a camel's-hair pencil dipped in chloroform.

— *The Clinic* takes from a German exchange the following account of the so-called swallowing of the tongue, which, as it remarks, had for a long time disappeared from the medical stage. The author revives it, as follows:—

A lady from Crefeld told him she had seen twenty cases, and he obtained further information from Dr. Schneider, of Crefeld. His own son, aged four months, strong, suffering with a slight whooping-cough without complications, died suddenly in the lap of the nurse with symptoms of asphyxia. Ten minutes after death he found the tongue pressed upwards, and the end fast in the throat.

A few days later a second case came under his notice, and again in a child suffering with whooping-cough that in a similar manner died of suffocation.

Dr. Seydeler, of Bromburg, relates a third case, in which a child eight days old took a few drops of tincture of rhubarb; scarcely had it taken the medicine when it was seized with a violent attack of suffocation. It was saved by instantly drawing the tongue forward. In this case the tip of the tongue was not driven back, and Dr. Seydeler was of opinion that the tongue had simply sunk backwards, probably because the child when it took the medicine had violently withdrawn its tongue.

Such an occurrence is perhaps possible, but we think we shall hardly accept the twenty cases mentioned by the "lady from Crefeld" without further details.

— *The Lancet* states that an important report from the British consul-general at Algiers has recently been published, relative to the growth of the *Eucalyptus globulus* in Northwest Africa. The evil consequences that followed the destruction of forests in the neighborhood of Tunis and Algeria have been the subject of serious concern, and it is found that the planting of the *Eucalyptus* is the best practical remedy. The tree grows quickly, and attains in Algeria in six or seven years the dimensions of an oak of twenty years' growth, producing at the same time hard, dense timber, — so dense indeed that, until properly seasoned, it sinks even in salt water. Marked improvement has taken place in the sanitary surroundings since these trees were planted. They appear to destroy the miasma by absorbing the moisture of the soil, and so assisting to drain the marshes. More than one hundred thousand *Eucalyptus*-trees have been planted in two years by the managers of the Mokta-el-Hadid iron mines, the result of which is that their workmen can live at the place all the year round.

— With the view to legislation on baby-farming, the Prussian government, says the *Medical Examiner*, has been collecting official information, through the provincial governors and others, as to the character of foster-mothers and the number of children under their care. The facts thus collected reveal a horrible state of neglect, cruelty, and even murder by those whose profession it is to take under their charge illegitimate children. The proposed legislative measure embodies, *inter alia*, restrictions to the following effect, namely: No woman will be allowed to take charge of a child under six years of age during the parent's life, except with the sanction of the police authorities of the

district in which the parent resides. At any time the police license is liable to revocation. Persons licensed to undertake the care of such children are compelled to grant official inspection at any time in regard to the condition, system of diet, and training of the children under their guardianship.

— It is reported that Dr. Matthews Duncan, of Edinburgh, has consented to accept the post of obstetric physician to St. Bartholomew's Hospital, in London. He is said to have been always extremely popular with his Edinburgh classes.

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### BOSTON CITY HOSPITAL.

#### MEDICAL CASES OF DR. O. W. DOE.

[REPORTED BY E. O. OTIS.]

**CASE I.** *Herpes Zoster treated by Chloroform Injections.* — M. J. O'N., twenty-three years old, entered the hospital July 23d with the following history: Ten days before, he began to be annoyed with pain in the chest about both nipples. In the course of a few days he noticed an eruption on the right side, which continued up to entrance. At that time the pain, severe in character, was mostly confined to the seat of eruption, extending across the axilla up to the right shoulder and down the arm towards the elbow. Appetite and digestion were good. Bowels and micturition were normal. Pulse 96. Temperature 100°. An injection of fifteen minims of chloroform was ordered night and morning, locally in the affected side. After two or three injections the pain was entirely relieved, and remained so, while the eruption, which was a well-marked type of herpes zoster, left to itself, healed rapidly, and the patient was discharged well, August 1st.

**CASE II.** *Acute Bright's Disease, with Severe Uremic Convulsions; Recovery.* — P. McN., of medium size and stoutly built, a laborer, thirty-three years old, entered the hospital July 13th. He said he was always a very strong man, and that he was perfectly well up to the evening of the 8th, when he noticed swelling of the face and feet, and was attacked with diarrhoea and pain in the upper abdomen. At the time of entrance there was quite general anasarca, and for the previous twenty-four hours there had been a heavy pain in his forehead. He slept well, and felt "as strong as ever." Appetite good. Bowels regular. Micturition free.

The patient said he had been accustomed to use alcoholic liquors freely, but stopped two weeks ago, and just previous to his entrance he worked thirty-six hours in the hold of a vessel. At the time of entrance his pulse was 70. Face flushed and swollen. Eyes reddened and suffused. Tongue with thin white coat.

The examination of his urine gave the following result: Specific gravity 1023. Albumen two per cent. Hyaline and epithelial casts, with a few blood corpuscles. He was given fifteen drops of the tincture of digitalis three times a day.

July 16th. The patient reports himself as feeling "as well as ever," and appetite "first-rate." There is now only a little swelling about the eyes, and none of the extremities.

July 19th. The urine was again examined, with the following result: Specific gravity 1022. Albumen two per cent. Fine granular and hyaline casts. A few blood and pus cells.

July 20th. The house physician was called about three A. M., and found the patient in a semi-comatose condition, having had previously two severe uræmic convulsions. One sixth of a grain of nitrite of pilocarpine was injected subcutaneously, and in the course of ten or fifteen minutes quite free diaphoresis was produced. Hot cloths and flannel blankets were applied. In a short time the convulsions returned and continued during the day. At the time of the morning visit — about half past ten o'clock — he was put under the influence of ether, and kept so the greater part of the day. Pulse was 100; pupils contracted; had passed urine twice since eight o'clock, eight ounces in quantity. He was given of the following mixture half an ounce every two hours: —

Ry Potassii citratis	3i.
Tr. digitalis	3 iiss.
Aqua	ad 3 viij. M.

Also one fifth of a grain of elaterium. A hot poultice was applied across the loins.

July 21st. Pulse 72. Answers questions; says he is better. Two mild convulsions during the night. Passed about twenty ounces of urine since yesterday. Omit prescription of the 18th. The patient was ordered to be put in a hot bath, and placed in blankets for two hours. Examination of the urine gave the following result: Specific gravity 1023. Albumen two per cent. Pus and squamous epithelium. No casts.

July 22d. No swelling anywhere. Bowels and micturition free. On alternate days give hot bath and wrap in blankets for two hours.

July 23d. Three convulsions since the last visit. Pulse 60. Sweating profusely. Mind clear. Passed thirty ounces of urine at one time yesterday. Ordered one fifth of a grain of elaterium.

July 25th. Examination of urine: Specific gravity 1021. Urea normal. Albumen three fourths of one per cent. No casts.

July 28th. Patient up and about the ward. No return of convulsions.

July 31st. Examination of urine: Specific gravity 1020. Albumen one per cent.

August 2d. Appears well the last two or three days. Passed sixty-four ounces of urine in twenty-four hours.

August 3d. Give the hot baths every other day.

August 7th, 9th, 11th, and 14th. The examinations of the urine were as follows: 7th. Albumen one fourth of one per cent. No casts. 9th. Albumen one and one half per cent. No casts. 11th. Albumen one half of one per cent. Specific gravity 1030. 14th. Albumen a trace. Specific gravity 1020. On the 14th he was discharged, saying he felt perfectly well and wanted to go to work.

CASE III. *Chorea treated by Chloral Suppositories and Valerianate of Zinc.* — M. B., domestic, twenty years old, was discharged from the hospital, well, on the 4th of April, after confinement. She reentered on the 15th of May with the following history: About a week before, she began to have twitchings of the muscles of the left side; the muscles of the face contracting

and relaxing caused great distortion, while the arm and leg would be thrown into all sorts of positions. These motions seemed to be excited by contact with others, and whenever attention was directed towards her. There was no assignable cause for the beginning of this condition. On entrance, the pupil of the right eye was larger than that of the left; she was unable to protrude her tongue, and could not articulate distinctly. She understood what was said to her, and tried to answer intelligently. Appetite fair. Bowels regular. Skin natural. Tongue pasty. Temperature 98.5°. Pulse 90.

May 16th. Says she has not slept much until this morning, though thirty grains of bromide of potash was ordered last night. Ordered five grains of citrate of iron and quinine three times daily.

May 17th. Last night had an attack of acute maniacal excitement, so severe that she had to be confined in a camisole; this morning delirium gone, and only choreic symptoms present. Ordered twenty grains of bromide of potassium morning and night.

May 22d. Omit prescription of the 16th and give five drops of liquor of arseniate of potash three times daily.

May 27th. No essential change in the condition of the patient. Choreic movements of the left side still continue. Complains of nausea and vomiting. Omit prescription of the 22d in consequence. Ether spray to be applied to the spine for fifteen minutes morning and night.

June 1st. Patient in about the same condition; no marked improvement. Omit ether spray. Ordered twenty grains of chloral hydrate at night.

June 2d. Slept well last night; repeat the chloral to-night.

June 4th. Jactitations less violent; sleeps pretty quietly at night. Repeat chloral every night.

June 11th. Much improvement noticed. Movements much diminished. Very quiet at time of visit.

Rj Chloral hydrate . . . . . grs. x.

Olei theobromæ . . . . . q. s.

M. Ft. suppositorium N. i.

Sig. One suppository to be used morning and night.

June 14th. Patient worse than on the 11th; unable to stand without help. Continue suppository. Ordered two grains of valerianate of zinc three times daily.

June 18th. More quiet for the last three days; more rational.

June 20th. Marked improvement in the last two days. Walks about the ward with scarcely any movements of chorea. Perfectly rational, and wants to go out. Give the suppository only at night.

July 9th. No symptoms of chorea. Ordered half an ounce of compound tincture of cinchona three times daily.

July 20th. Discharged, nearly well.

CASE IV. *Pelvic Cellulitis, with Serous Evacuation.* — S. W., twenty-seven years old, married, entered the hospital June 30th, with the following history: Three weeks before, she took a cold bath just before the catamenia had ceased, and since that time had had griping pains, lasting about a minute, after micturition, which was frequent. These pains she located in the left inguinal region. Catamenia have always been regular, and not attended with much pain

or flowing, lasting usually about three days. At the time of entrance the temperature was 100.5°, and pulse 120. The examination of the urine showed nothing abnormal. There was marked tenderness just to the left of the hypogastrium, accompanied with swelling and pain. Hot vaginal douche and starch poultice, as hot as could be borne, were ordered.

July 2d. Over left inguinal region is felt a hard, distinct mass, extending up to a line parallel with the anterior superior spinous process of the ilium. Marked tenderness on pressure. Tenderness is also felt in the median line and right inguinal fossa, where there is a sense of resistance, felt to be more marked at the centre.

On vaginal examination a hard, distinct mass was felt filling up the space to the left of the uterus, evidently the same which was felt by external examination. To the right of the fundus was also felt a small indurated mass, high up, which is quite sensitive on pressure, more so than that on the left side. Os low in the vagina. Cervix immovable. Fundus, from the anterior wall of the vagina, slightly sensitive on pressure; markedly so on the posterior wall. Sound passes two and three fifths inches. Patient passes urine with ease, but there follows a sharp pain across the hypogastric region, continuing about a minute. Bowels moved about once in three days, causing great pain, which lasts but a few moments. To remain in bed. Hot vaginal douche night and morning. Hypogastric and inguinal regions to be painted night and morning with ethereal tincture of iodine. Every other night a tampon to be inserted in the left cul-de-sac, soaked in the following:—

Ry Potassii iodidi . . . . .	grs. xx.
Glycerinæ . . . . .	3i. M.

July 4th. Induration on the left side as before, but slightly less on the right side, and more tender on pressure. Ordered one drachm of ferrated tincture of cinchona three times daily.

July 7th. The mass on the left side is very much enlarged, filling the left and posterior part of the pelvic cavity, pressing deeply down and back upon the rectum. It is very sensitive to touch, and has an indistinct sense of fluctuation just posterior and to the left of the cervix, where an aspirator needle was introduced and three ounces and a half of serous fluid withdrawn. Hot flaxseed poultice was applied externally, and one eighth of a grain of morphia, as occasion required, to relieve pain. For three days after this the temperature ranged from 99° to 101°.

July 11th. Morning temperature 98.6°; pulse 104. Evening temperature 100°; pulse 102. Indurated mass externally now felt on the left, two inches below the umbilicus, hard and resisting. On vaginal examination enlargement not so low as at last report, but occupying a larger space on the right side, and felt posterior to the uterus in connection with the mass on the left. On rectal examination a very small, soft, semi-fluid mass is felt at the most dependent part of the tumor posteriorly. But little pain on examination. Patient generally improving. Considerable distress at time of defecation.

July 12th. Omit the prescription of the 4th and give

Ry Ferri et quiniæ citratæ . . . . .	grs. vii.
Vini xerici . . . . .	3ss. M.

three times daily.

and relaxing caused great distortion, while the arm and leg would be thrown into all sorts of positions. These motions seemed to be excited by contact with others, and whenever attention was directed towards her. There was no assignable cause for the beginning of this condition. On entrance, the pupil of the right eye was larger than that of the left; she was unable to protrude her tongue, and could not articulate distinctly. She understood what was said to her, and tried to answer intelligently. Appetite fair. Bowels regular. Skin natural. Tongue pasty. Temperature 98.5°. Pulse 90.

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Ry Ferri et quiniæ citratæ . . . . .	grs. vii.
Vini xerici . . . . .	3ss. M.

three times daily.

July 19th. Very slight tenderness only in the right iliac region. No swelling noticed externally in either inguinal region. May sit up an hour every day.

July 22d. The only induration remaining is on the left side and posteriorly. Scarcely any tenderness on examination.

July 27th. Patient sitting up. No pain in pelvic region. Bowels regular. Very anæmic. Omit prescription of the 12th and give thirty drops of tincture of chloride of iron three times a day.

August 1st. The mass spoken of on the 22d is rapidly disappearing.

August 11th. Very slight induration remaining. General condition much improved. No pain.

On the 17th she was discharged, well.

#### COMPARATIVE MORTALITY-RATES FOR THE WEEK ENDING OCTOBER 6, 1877.

	Estimated Population, July 1, 1877.	Total Mortality for the Week.	Annual Death-Rate per 1000 for the Week.	Death-Rate for the Year 1876.
New York	1,077,228	513	24.76	27.46
Philadelphia	850,856	256	15.65	22.88
Brooklyn	527,830	203	19.99	24.31
Chicago	420,000	142	17.58	20.41
Boston	363,940	151	21.58	23.39
Providence	103,000	36	18.17	18.34
Worcester	52,977	20	19.63	22.00
Lowell	53,678	21	20.34	22.21
Cambridge	51,572	27	27.22	20.54
Fall River	50,372	21	21.68	22.04
Lawrence	37,626	13	17.96	23.32
Lynn	34,524	16	24.09	21.37
Springfield	32,976	6	9.46	19.69
Salem	26,739	10	19.45	23.57

BOOKS AND PAMPHLETS RECEIVED. — A Treatise on the Pathology of the Urine, including a Complete Guide to its Analysis. By J. L. W. Thudicum, M. D. Second Edition. Philadelphia: Lindsay and Blakiston. 1877. (For sale by A. Williams & Co.)

Personal Appearance and the Culture of Beauty, with Hints as to Character. By T. S. Sorinsky, M. D. Philadelphia: Allen, Lane, & Scott. 1877.

The Physiology of Mind. The First Part of a Third Edition. By Henry Maudsley, M. D. New York: D. Appleton & Co. 1877. (For sale by A. Williams & Co.)

Thirty-Fifth Report to the Legislature of Massachusetts, relating to the Registry and Return of Births, Marriages, and Deaths in the Commonwealth for the Year ending December 31, 1876. With Editorial Remarks by F. W. Draper, M. D. 1877.

The Sanitary Condition of Portland. A Report presented to the Maine Medical Association, by F. H. Gerrish, M. D. Portland. 1877.

Respiration of Compressed and Rarefied Air in Pulmonary Diseases. By F. H. Davis, M. D., of Chicago. (Reprinted from the Chicago Medical Journal and Examiner, October, 1877.)